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# The state of AI adoption in Telecom and the road ahead

Telecom's primary AI battleground, preferred approach, risks, and the way forward

# Foreword

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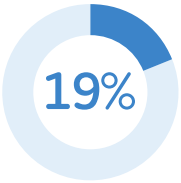
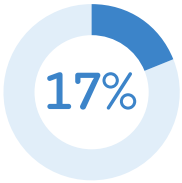
Artificial intelligence is rapidly becoming pivotal to how telecom operators modernise networks, engage customers, and run the enterprise. As AI moves beyond experimentation, telecom leaders are increasingly focused on scaling its impact across core operations while addressing the constraints of legacy infrastructure, regulatory requirements, and talent availability. This research examines how telecom operators across North America, UK, Europe, APAC, and MEA are adopting AI, where value is being realised, and what is limiting progress at scale.

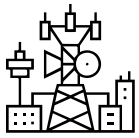
## Core findings from the study:



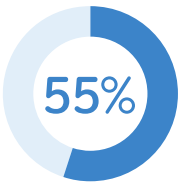

of telcos are in the AI pilot phase.



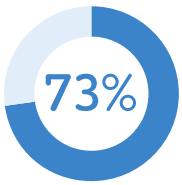

remain in exploration, while a considerable number of them are in the process of scaling deployments.



Network & operations is the leading AI adoption area in Telecom, followed by customer experience (CX).




of telcos are exploring potential use cases of agentic AI, resulting in broad early traction for the technology.




of respondents cite modernising legacy systems as a key focus for AI use within the IT function.

The findings reveal a decisive shift towards enterprise-wide AI deployment. However, the adoption is uneven. While investment intent is strong and confidence in returns is rising, legacy systems, governance complexity, and skill gaps continue to shape the pace and form of AI deployment. As a result, operators are rethinking their operating models, partnerships, and deployment approaches to optimise and expedite outcomes.

Together, these insights highlight a defining moment for the telecom industry, one in which AI is no longer an optional capability, but a foundational enabler of future competitiveness.

# Executive summary

AI adoption in the telecom industry has reached a clear transition point. A global survey of **300** telecom executives and in-depth interviews across four regions, show that AI is moving decisively from pilots to enterprise-wide deployment. Nearly half of the surveyed operators are already in the process of scaling AI across the organisations, signalling growing confidence in its ability to deliver tangible business value.

Customer experience is amongst the most widely adopted AI use cases globally. Generative AI (GenAI) and early agentic capabilities are enabling greater personalisation, faster resolution, and improved service efficiency. On average, 76% of operators have deployed agentic AI-led CX automation, making it a common starting point for AI investment across regions. Nearly **70%** of operators are prioritising CX-focused AI investments in the near term. Under the AI-for-IT umbrella, **73%** of telecom operators primarily apply AI to IT modernisation to achieve improved scalability, resilience, and data readiness.

Investment confidence is strong but measured. Most large telcos report AI budgets in the **USD 51-100 million** range, with **64%** expecting returns within **12-24 months**. Budget constraints are therefore not the primary challenge; instead, data quality (along with skills shortage, governance complexity, and integration with legacy systems) continue to shape adoption outcomes.

As AI scales, telecom operators are seeking the right balance between innovation, risk, compliance and control. It is evident from the emergence of hybrid AI structures, outcome-based commercial models, and increased interest in sovereign and controlled deployment approaches.

# The current AI maturity level in Telecom

## Key takeaways:

Large telcos are planning to allocate up to **20%** of total IT spend over the next year to AI.

Most operators plan to invest in AI-enabling infrastructure in the next **12–18 months**.

Networks and operations attract the highest share of AI investment.

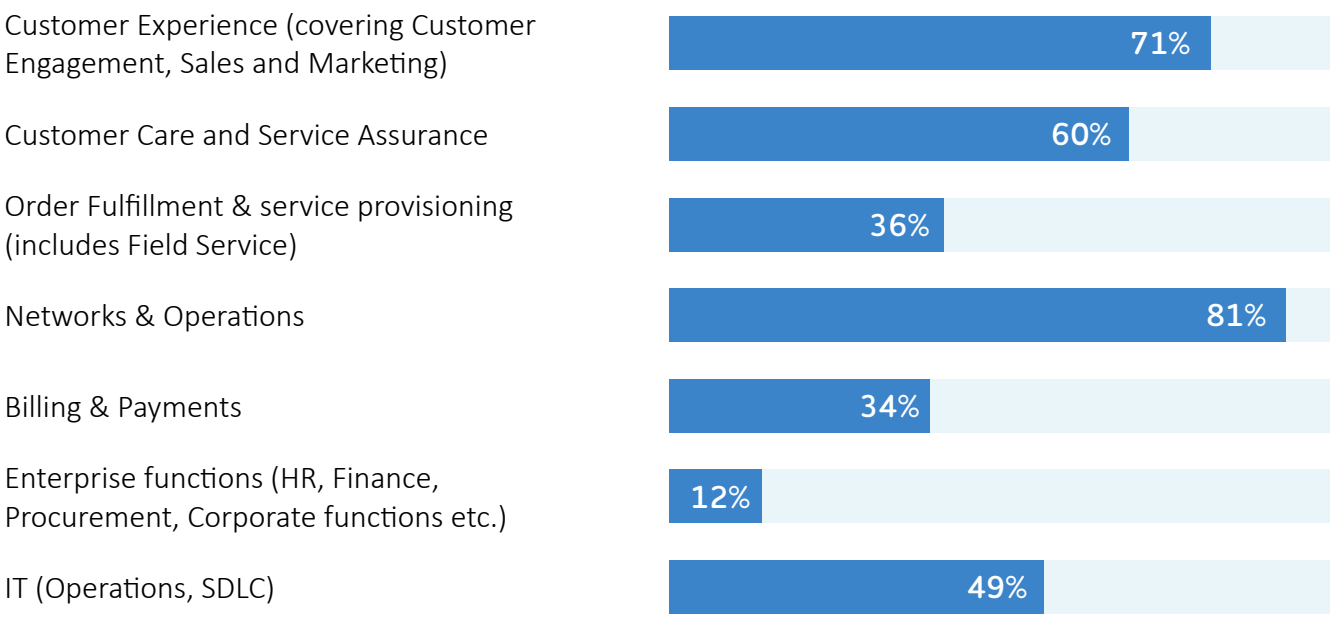
Customer service is the most viable near-term domain for expanding into agentic AI.

AI adoption in telecom has moved beyond experimentation into a scaling phase. Nearly half of surveyed operators report enterprise-wide deployment, indicating that AI is increasingly viewed as a core business capability rather than a discrete innovation initiative. While many organisations remain in pilot or limited-deployment stages, the overall trajectory points towards broader and more structured adoption.

Adoption maturity varies by use case. Globally, a huge majority of telecom operators apply AI primarily to networks and operations, reflecting the industry's focus on enabling scalability and real-time intelligence. CX and service assurance are the second and third biggest applications of AI, worldwide.

However, the legacy IT landscape continues to constrain progress, limiting data integration and slowing deployment. This tension between ambition and readiness shapes much of the current AI landscape.

## AI application in Telecom globally



With more than 4 in 5 telecom companies deploying AI in networks and operations on average globally, AI is rapidly becoming a foundational capability for core telecom infrastructure modernisation.

The findings suggest that telecom operators can no longer treat infrastructure as a supporting layer but as the central enabler of future AI value. As a result, investment decisions over the next **12-18 months** are likely to be shaped by the need for long-term scalability, resilience, and control—essential for laying the groundwork for more advanced AI capabilities.

AI has broken the stereotypes of technology adoption profiles (firmographics) of enterprises, such as risk leaders, smart followers and all variants in between. Across the geographies and irrespective of the size of the CSPs and service segments, AI adoption has been a levelling force in the industry, demonstrating how regions like APAC and MEA have closed gaps with EU and NA geographies/markets, even leading in some domains.

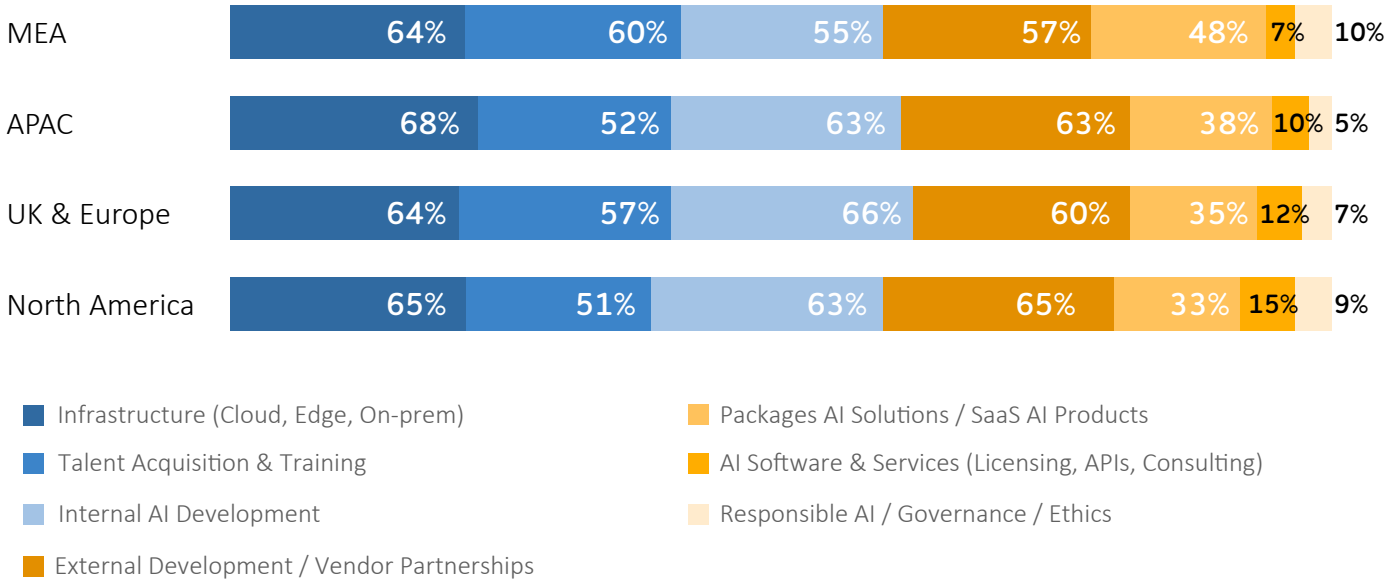
## AI infrastructure dominates Telecom investment plans

AI investment in the telecom industry is being shaped less by use-case experimentation and more by foundational readiness. The research shows that AI infrastructure has emerged as the dominant investment priority, reflecting a clear understanding that scalable AI outcomes depend on modernised networks, platforms, and data architecture. However, despite sustained investment intent, infrastructure also remains the top constraint to AI adoption. Legacy systems continue to limit data accessibility, interoperability, and real-time decision-making.

Telecom AI investment priorities in the next 1-1.5 years: Infrastructure > internal AI development > vendor partnerships > talent acquisition and training

Region-wise, nearly two-thirds of telecom operators are focusing on AI infrastructure and enablement spanning cloud, edge, and on-premises environments. Rather than building or expanding isolated applications, operators are investing in strengthening the underlying foundation required to support AI at scale. This infrastructure-led investment approach is consistent across both mature and emerging markets, although the pace and depth of adoption vary by region.

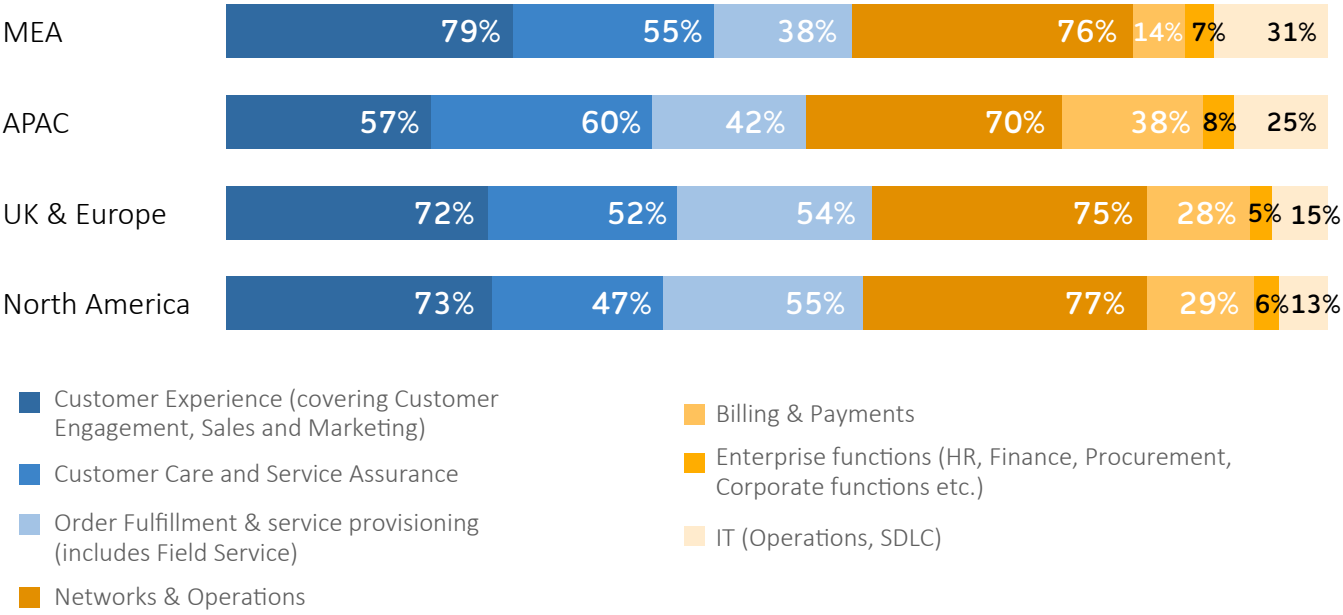
## Key investment areas for AI enablement by region




Nearly two-thirds of telcos across regions are planning to invest in cloud, edge, and on-premises infrastructure for AI enablement in the next 1-1.5 years.

Function-wise, network and infrastructure attract the most AI investments, with nearly **three-fourths of telcos** focusing on it, outpacing even customer experience and service assurance. This suggests that near-term AI spending is being channelled towards improving scalability, resilience, and data availability rather than expanding front-end innovation alone. While customer experience remains a strong second, CX investments are increasingly dependent on the underlying infrastructure readiness. Other functions such as order fulfilment and field services, billing and payments, and IT operations and software development, attract comparatively lower investments, indicating that operators may be viewing them as subsequent phases once core platforms are stabilised.

## Key business/functional areas for AI investment by region



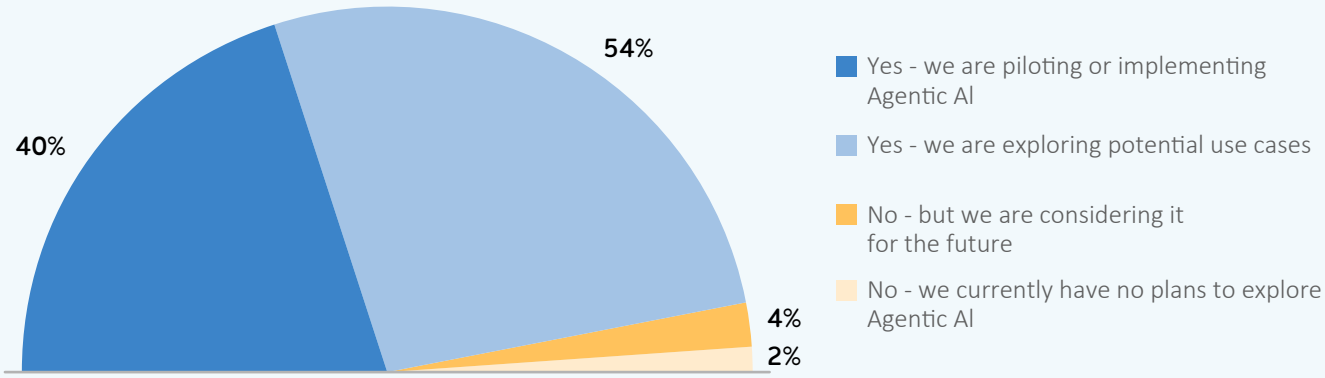

More than two-thirds of telecom companies will channel their AI investments into network & operations in the next 1-1.5 years globally.

## Agentic AI emerges as the next frontier in Telecom

Agentic AI adoption is increasingly gaining traction in telecom, marking a shift from assistive and generative models to autonomous agents capable of executing tasks with minimum human intervention. While still early in maturity, experimentation is advancing rapidly, with **94%** of the operators either already piloting or in the process of exploring the Agentic AI use cases.

Platform architecture and protocols for interoperability of agentic solutions are solving the scalability issue. However, building trustworthy and secure AI solutions is the next frontier; this is not a pure engineering problem. The same features of AI used by developers are also being used by threat actors and cyberagents. Understanding and modelling contexts and intent in AI-enabled autonomous systems is critical not just from a business perspective but also from ethics and fair usage policies.

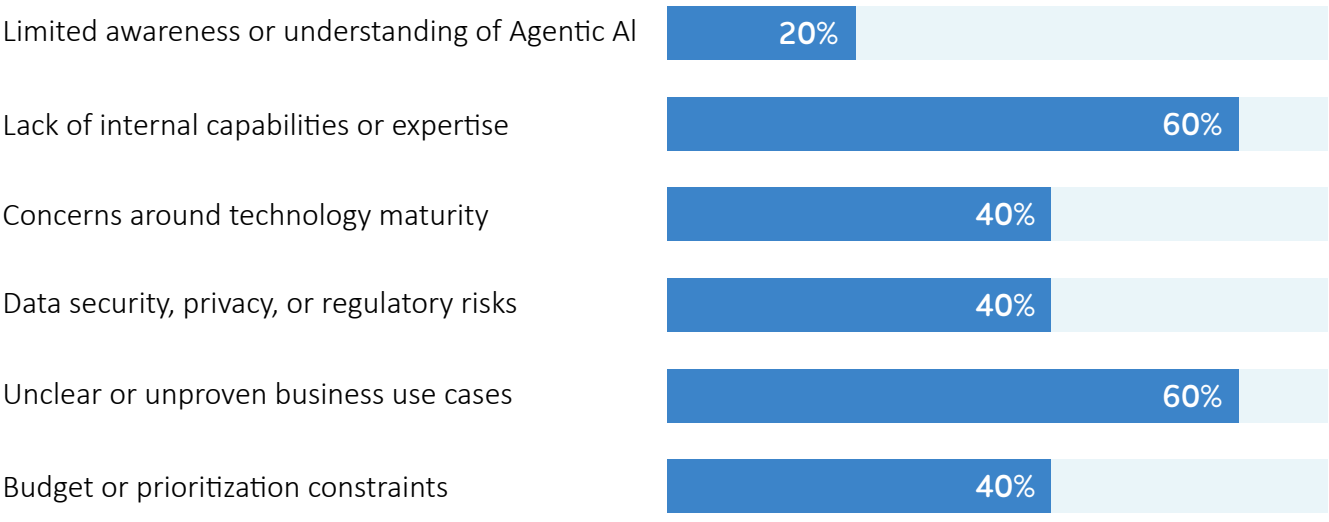
## Agentic AI adoption/exploration plans




While more than half of telcos are exploring potential agentic AI use cases, 40% have already initiated a pilot.

For telcos that have not started exploring agentic AI, the research identifies a lack of expertise and unproven business value as the primary deterrents. At the same time, more than half of the respondents said their organisation are exploring potential use cases while more than a third have already initiated one or more pilots.

## Factors behind not exploring agentic AI




The majority of telecom operators that do not intend to explore agentic AI cite lack of expertise and unproven business use cases as the primary reason for their reluctance.

Overall, the findings position agentic AI as a fast-emerging yet still selective frontier. In the near term, agentic AI is most likely to expand within tightly controlled domains before broader enterprise-scale deployment becomes viable.

# The preferred course for AI implementation and scaling

**Key takeaways:**

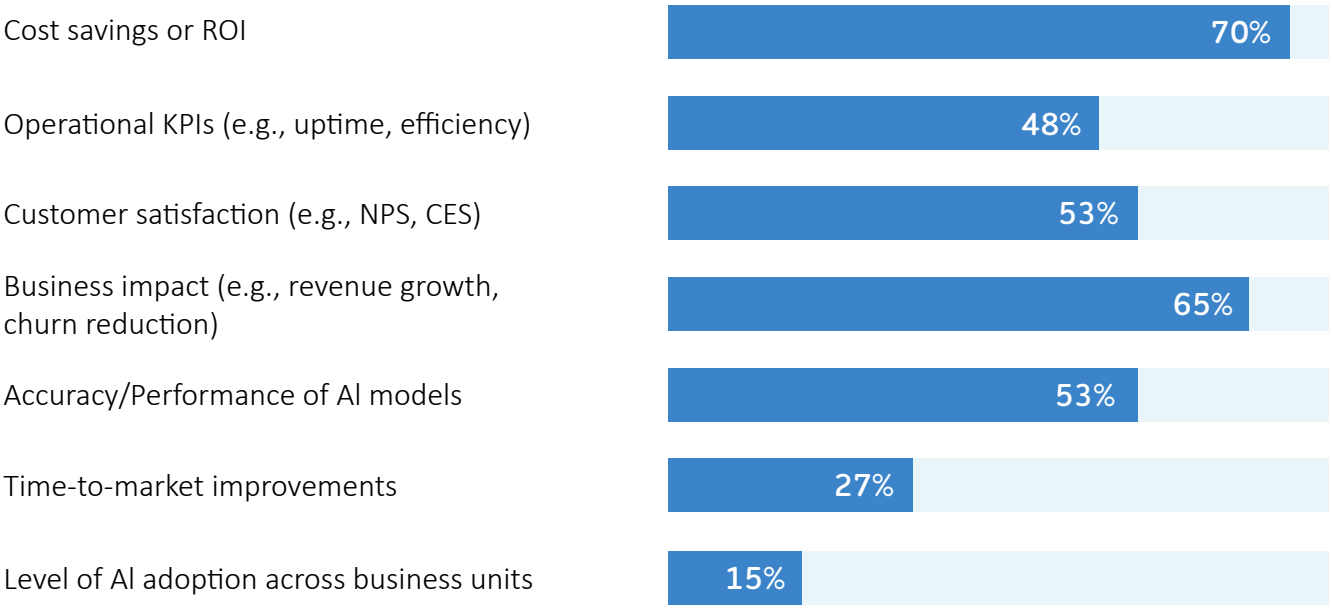
- Telcos are adopting hybrid AI operating models to balance scale and control.
- AI success is measured through a balanced scorecard, not individual KPIs.
- External partners play a critical role across strategy, execution, and governance.
- Cloud-first strategies dominate, even as interest in sovereign AI accelerates.

As AI becomes integral to telecom transformation, operators are formalising how AI is implemented, governed, and scaled. Telcos prefer cloud-first strategies for intra-organisation deployment of AI, with only a quarter opting for on-premises or edge environments. Yet, they maintain a flexible offerings portfolio and offer solutions according to their customers' preferences, including sovereign AI platforms, AI factories, and more. The research indicates a shift away from ad hoc experimentation towards structured operating models supported by external partnerships. This evolution reflects growing pressure on AI initiatives to deliver measurable outcomes across financial, operational, and customer dimensions.

## Leading KPIs

Telecom operators are adopting a balanced scorecard approach to measuring AI success, rather than relying on a single performance indicator. Financial impact remains the primary lens, with **70%** of organisations tracking cost savings and ROI. At the same time, **65%** measure broader business impact, including revenue growth and churn reduction, while **53%** track model accuracy/performance and customer satisfaction. The fact that the top four success metrics all exceed the **50%-mark** signals that AI deployment success is being assessed holistically, spanning financial returns, customer outcomes, and technical reliability.

### AI deployment success metrics

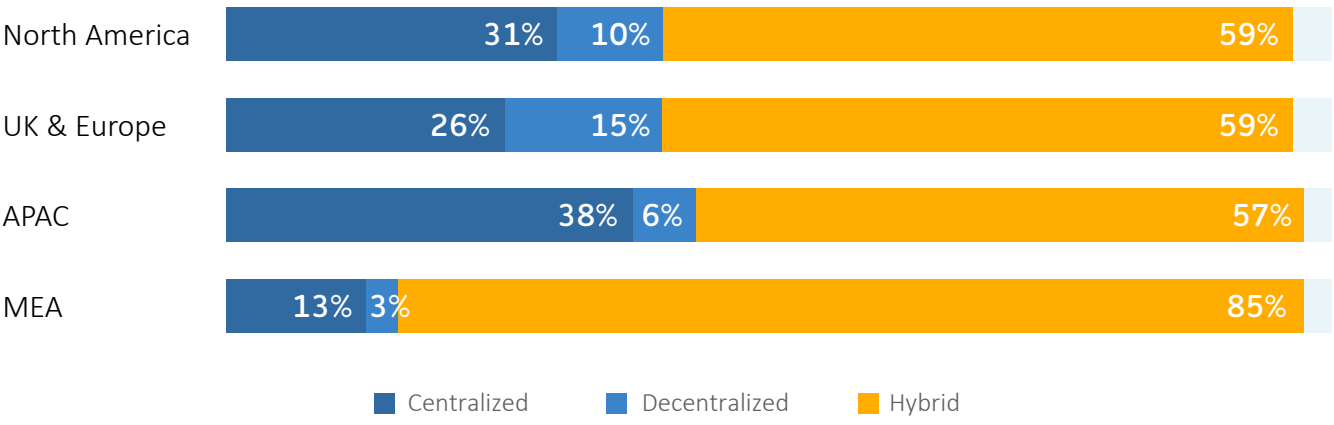



**Most telcos have adopted multiple metrics,** demonstrating a balanced scorecard approach rather than single-KPI tracking for AI success.

## Preferred implementation model

Implementation models reinforce the balance between control and agility. Most telecom operators favour hybrid AI operating structures, combining centralised governance with decentralised execution. Hybrid models are strongly preferred across regions, enabling enterprise-level oversight alongside local autonomy. While fully centralised models are also prevalent in some regions, decentralised approaches are generally limited. . This distribution highlights a clear industry consensus around hybrid execution as the most scalable and governable approach.

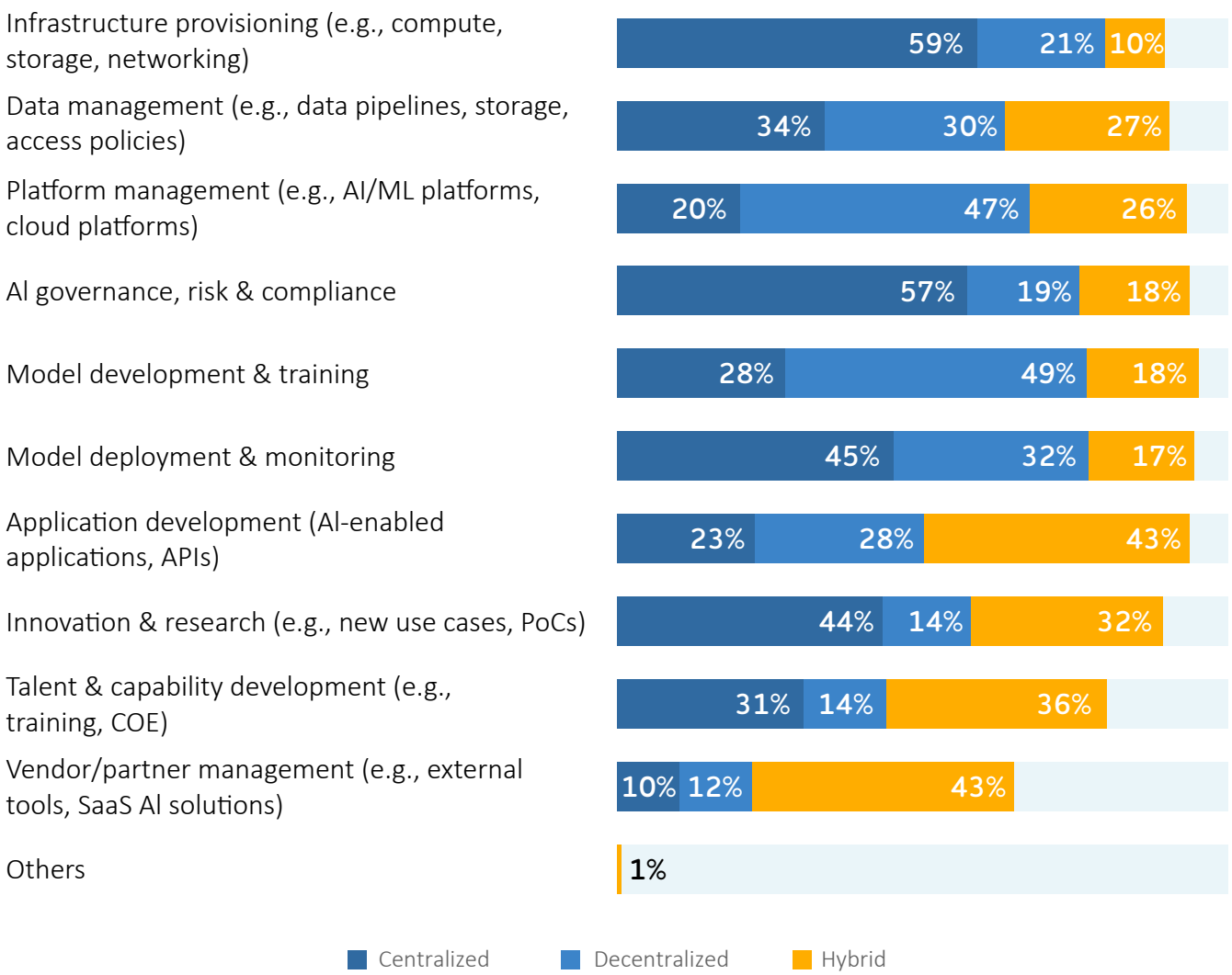
### AI operating model structure by region



The majority of telcos across regions focus on hybrid AI adoption, exhibiting a balance between centralised governance and local autonomy. AI centres of excellence are also predominantly hybrid across regions.

While execution is increasingly distributed, control over foundational capabilities remains centralised. The operating model data shows that **infrastructure and AI governance** are the most centralised AI-related activities. This reflects heightened sensitivity around platform stability, data security, regulatory compliance, and risk management areas where telecom operators prefer tighter oversight even as innovation is pushed closer to business units.

## Operating model structure by AI application

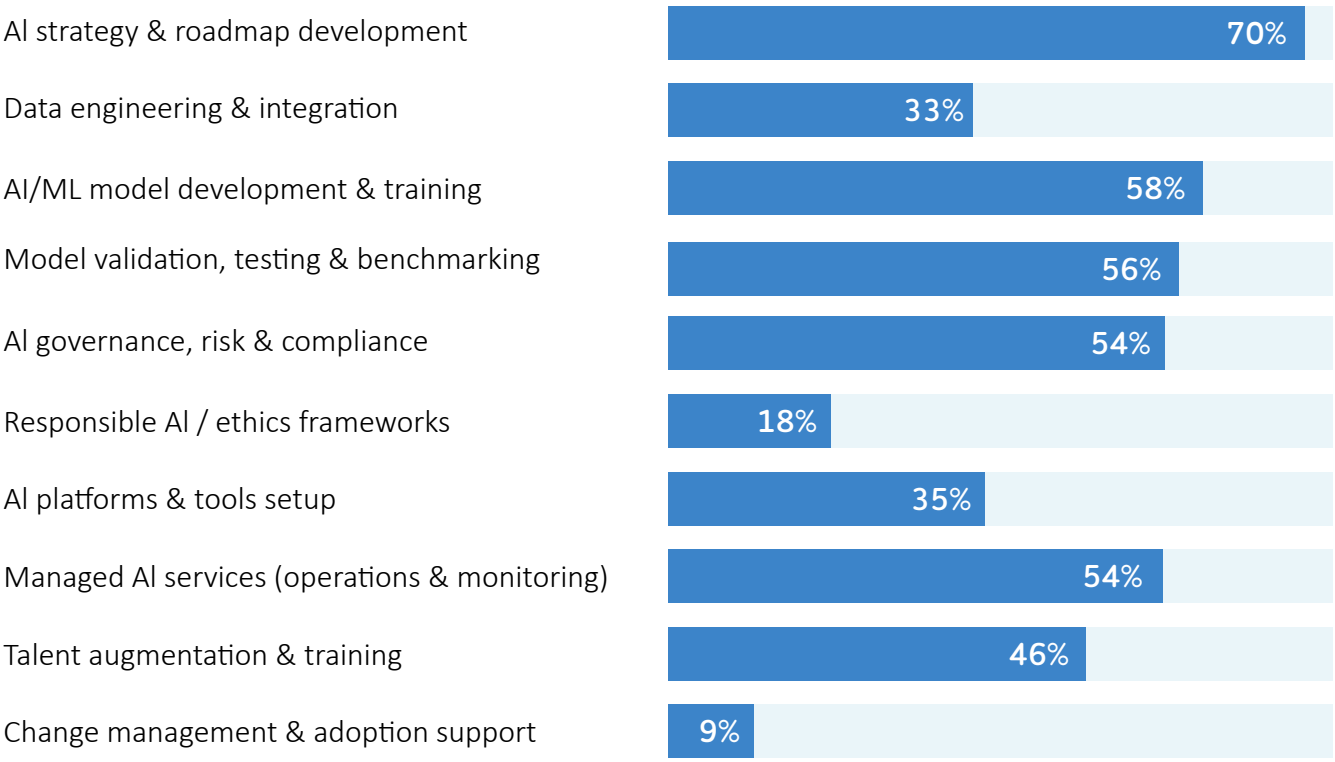


More than half of telecom operators have centralised infrastructure provisioning, AI governance, risk, and compliance, showing that organisations prefer tight control over foundational capabilities.

## External synergies

Strategic partnerships have become crucial for enabling this model, underscoring the need for synergy with external experts for long-term direction. In this regard, **more than two-thirds** of telcos leverage third-party technology consultants and providers for AI strategy and roadmap. Collaboration extends into execution, with **58%** involving partners in model training, **56%** in testing and benchmarking to ensure quality and scalability, and 54% in AI operations, indicating that operators prioritise agility over enablement. Other considerable areas of partner engagement include talent augmentation (**46%**) and platform set-up (**35%**).

### AI-related areas involving external partners




More than two-thirds of telecom operators engage external partners for AI strategy and roadmap development, which underscores the vast opportunity AI providers have in the industry.

Taken together, the findings show that AI implementation in telecom is no longer defined by technology choice alone, but by the ability to orchestrate operating models, governance, and partnerships at scale. Hybrid structures, outcome-led partnerships, and people-centric vendor strategies reflect a deliberate effort to balance speed with control and innovation with accountability.

However, as AI initiatives move deeper into core operations and autonomous capabilities, these same choices also expose structural limitations around skills, governance complexity, legacy infrastructure, and regulatory risk that increasingly shape how far and how fast AI can be deployed. It is these constraints and risk factors that now define the next phase of telecom AI adoption.

# Telecom AI adoption barriers and considerations

## Key takeaways:

Operational readiness has overtaken technology access as the main adoption constraint.

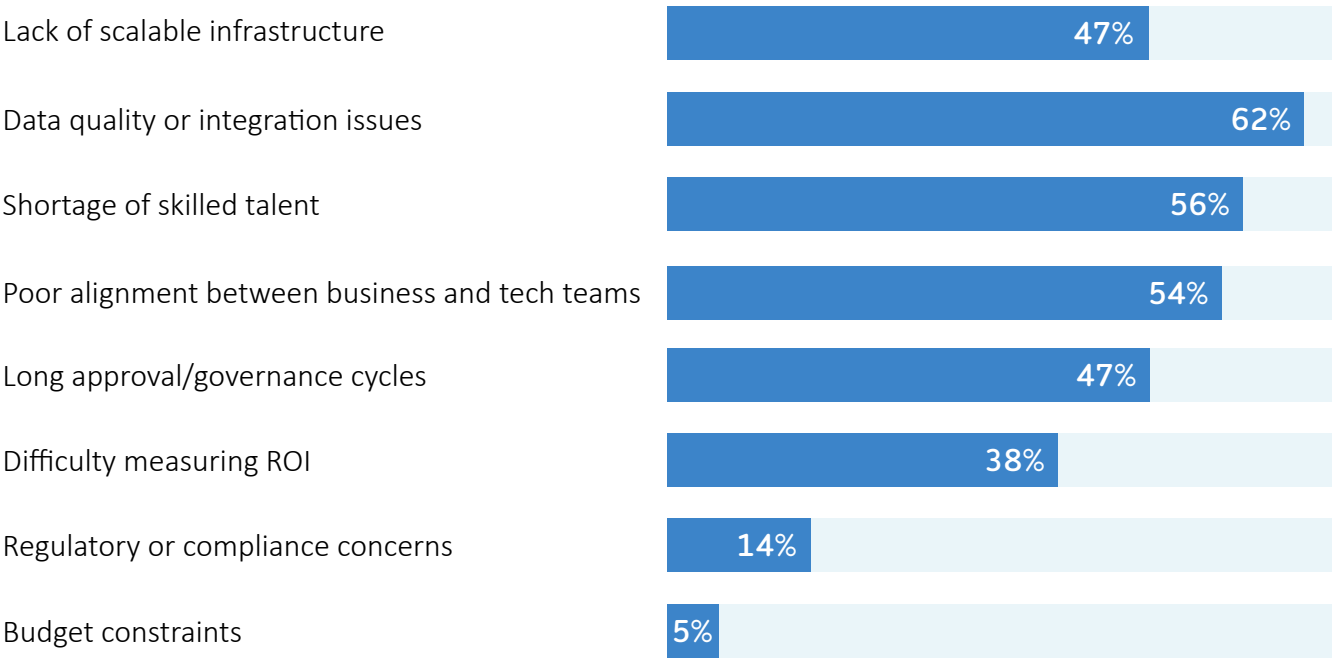
Legacy integration is the top expectation from AI providers.

Regulatory risk, skills shortages, and governance complexity limit AI scale.

Budget is the least significant constraint.

Data quality and integration are the primary constraints in scaling AI, followed by skill gaps and business-technology alignment. As client expectations rise, telcos are increasingly focusing on improving data quality and integrating legacy environments, acquiring as well as nurturing domain-specific expertise, and prioritising business-aligned outcomes over standalone AI innovations. The emphasis has shifted from 'what can AI do' to 'how reliably AI can be embedded into existing telecom operations.'

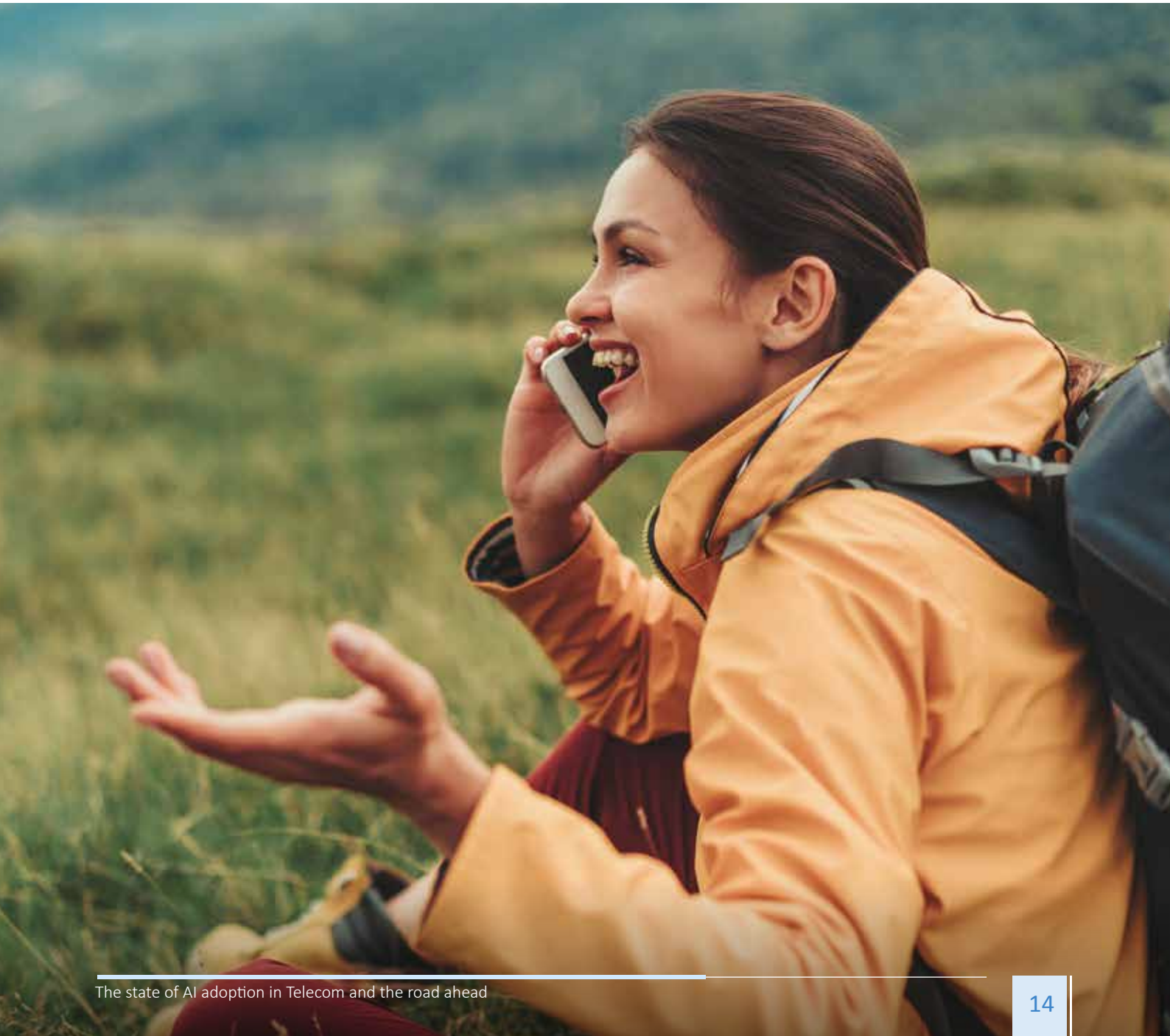
## Challenges faced during transition from PoC to production and scaling of AI solutions



**Data abundance alone is insufficient** for scaling AI beyond PoC; Telcos must improve data quality by seamlessly integrating enterprise systems.

This shift is clearly reflected in how telecom companies evaluate AI vendors. Legacy integration is their top priority (**59%**) for respondents, signalling that interoperability with existing systems has become a prerequisite for scaling AI. Domain specialisation and transparency (**53%**) are equally critical, as operators increasingly expect telecom-specific solutions and clearer visibility into model behaviour, limitations, and performance. Business alignment is also gaining prominence, with **43%** prioritising AI initiatives tied directly to business KPIs such as revenue uplift, churn reduction, and customer experience improvement rather than technical metrics alone.

The findings indicate that the next phase of telecom AI adoption will be shaped less by ambition and more by execution discipline. Addressing legacy complexity, talent shortages, governance maturity, and regulatory risk is now essential to converting AI investments into sustained business impact.



# AI adoption best practices for telcos

The study shows that AI advantage is no longer determined by experimentation or technology access, but by execution discipline, i.e., how effectively operators modernise infrastructure, align AI to core value streams, govern at scale, and manage risks. Below are a few high-level recommendations outlining the priorities that will separate AI leaders from the rest in the coming years:

**Improve quality, availability, and accessibility of data:** Telecom operators ought to prioritise data quality enhancement as the foundational step. The effectiveness of Gen AI and Agentic AI solutions is dependent on the robustness and reliability of the underlying data. IT modernisation and legacy integration are the key to superior data quality as well as improved interoperability and real-time accessibility needed for implementing agentic and advanced AI use cases. Without this foundation, AI investments risk remaining fragmented and sub-scale.

**Build talent alongside technology:** Capability gaps are now constraining the AI scale more than funding availability. Telecom companies should invest in centres of excellence and internal enablement programmes to facilitate structured AI talent development and reduce dependency on vendors.


**Anchor AI initiatives to core operational value pools:** Telcos should concentrate AI investments where the impact is measurable against long-term business objectives. Networks, operations, and customer experience have consistently emerged as the highest-value use cases with immense potential scope for higher efficiency, resilience, and service quality and lower churn. Business outcome should be the sole factor for use case selection, not novelty.

**Adopt hybrid operating and governance models:** Centralised control over infrastructure, data, and governance should be combined with decentralised execution closer to business units. Such hybrid models enable faster innovation while maintaining compliance, risk oversight, and strategic alignment, which are essential as AI deployments become more autonomous and business-critical over time.

**Shift decisively towards outcome-driven partnerships:** As AI initiatives mature, traditional delivery models are giving way to outcome-based and gain-share partnerships. Telcos should align vendor incentives to business KPIs, such as cost reduction, greater service reliability, and improved customer experience, ensuring accountability for results, not just implementation.

**Prepare early for regulatory and sovereignty requirements:** Regulatory, compliance, and data-sovereignty considerations are increasingly shaping AI deployment choices. Proactive planning for sovereign cloud and AI factory models will allow telecom operators to retain control over data, IP, and governance, while still leveraging partner ecosystems for scale and innovation.

**Define ROI expectations and success metrics from the outset:** With strong expectations of value realisation within 12–24 months, AI programmes must be designed with clear success measures upfront. A balanced scorecard comprising financial, operational, customer, and technical metrics will be critical to sustaining executive confidence and long-term investment momentum.

The PoCs are pivoting from narrow objectives of demonstration of AI use cases to broader themes, such as discovering newer patterns of insight mesh, data flows, and network traffic. These themes emerge in redesigned business functions with modular approaches and in the modernised system landscapes (legacy) that interface with the agentic architecture. The archetypes of roles and human-agent squad structures will emerge as trials pick up more complex scenarios.

Depending upon how effectively they are implemented, these recommendations will enable telcos to translate the AI promise into sustained business value.

# Research demographics

A global survey of **300** telecom executives and in-depth interviews were conducted across:

**Asia-Pacific (APAC)**
20%

**Middle East and Africa (MEA)**
14%

**Europe and the UK**
33%

**North America**
33%

**The respondents' profiles/designations:**

- Vice President (VP) of Innovation & Analytics
- Director of Technology
- Chief Information Officer (CIO)
- AI Strategy Director in Telecom & Media
- Head of Technology Transformation
- Senior Industry Principal
- Chief Technology Officer (CTO)
- Group Vice President (VP)
- Data & AI Leader
- AI Technology Leader

# Notes

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# About TCS

Tata Consultancy Services) (BSE: 532540, NSE: TCS) is the technology partner of choice for industry-leading organizations worldwide. Since its inception in 1968, TCS has upheld the highest standards of innovation, engineering excellence and customer service.

It has set an aspiration to become the world's largest AI-led technology services company and is enabling its clients to transform themselves across the full AI stack, from infrastructure to intelligence.

Rooted in the heritage of the Tata Group, TCS is focused on creating long term value for its clients, its investors, its employees, and the community at large. With a highly skilled workforce spread across 55 countries and 202 service delivery centers across the world, the company has been recognized as a top employer in six continents. With the ability to rapidly apply and scale new technologies, the company has built long term partnerships with its clients – helping them emerge as perpetually adaptive enterprises. Many of these relationships have endured into decades and navigated every technology cycle, from mainframes in the 1970s to artificial intelligence today.

TCS sponsors 14 of the world’s most prestigious marathons and endurance events, including the TCS New York City Marathon, TCS London Marathon and TCS Sydney Marathon with a focus on promoting health, sustainability, and community empowerment.

TCS generated consolidated revenues of over US $30 billion in the fiscal year ended March 31, 2025. For more information, visit **www.tcs.com**